Safety automation solutions
Preventa configurable safety controllers
Type XPS MC

105739

XPS MC16ZC

105545

XPS MC32ZC

Presentation

Configurable safety controllers XPS MC●●Z● are designed to provide a solution for safety applications requiring conformity to category 4 of standard EN 954-1 and SIL 3 requirements of standard IEC 61508.
The range of configurable safety controllers comprises 6 products, each with different technical characteristics.

Configurable controllers	Safety inputs	Safety outputs *(1)*	Bus and networks connection		
			CANopen bus	Profibus bus	Modbus network
XPS MC16Z	16	6 + 2 x 2	–	–	Yes
XPS MC16ZC	16	6 + 2 x 2	Yes	–	Yes
XPS MC16ZP	16	6 + 2 x 2		Yes, slave	Yes
XPS MC32Z	32	6 + 2 x 2	–	–	Yes
XPS MC32ZC	32	6 + 2 x 2	Yes	–	Yes
XPS MC32ZP	32	6 + 2 x 2		Yes, slave	Yes

Line control

The safety inputs are supplied by the various control outputs, in such a manner so as to monitor for short-circuits between the inputs, short-circuits between each input and earth or the presence of residual voltages.
The controller, assisted by the control outputs, continuously tests all the connected inputs. As soon as an error is detected on an input, all the outputs associated with this input are disconnected. Safety outputs associated with other inputs remain active.

Configuration

Safety controllers XPS MC●●Z● are configurable and addressable using software XPS MCWIN running on a PC. Connection accessories required: see page 38789/9.

Connections

For connection of safety inputs and outputs, safety controllers XPS MC●●Z● can be fitted with a choice of:
- screw connectors type XPS MCTS●●, or
- spring clip connectors type XPS MCTC●●.

These connectors are to be ordered separately, see page 38789/8.

(1) 10 control outputs total = 6 solid-state safety outputs + 2 x 2 relay safety outputs (4 relay outputs with guided contacts).

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Safety functions

Configuration of the safety functions is carried out using software XPSMCWIN which is available on the Safety Suite CD-ROM.

30 certified safety functions are available with this software and they are easily assignable to the safety outputs. The safety functions have multiple combination possibilities and various starting conditions.

The safety functions are:
- certified in accordance with EN 954-1 and IEC 61508,
- configurable in controller XPS MC using software XPSMCWIN which is available on the Safety Suite V1 software pack.

Main safety functions	Application schemes and functional diagrams, see pages
Emergency stop monitoring, with or without time delay, 1 or 2-channel wiring	38788/2 and 38788/3
Two-hand control (type III-C conforming to EN 574)	38788/4
Guard monitoring with 1 or 2 limit switches	38788/5 to 38788/9
Guard monitoring for injection presses and blowing machines	38788/10 and 38788/11
Magnetic switch monitoring	38788/12 and 38788/13
Sensing mat monitoring	38788/14 and 38788/15
Light curtain (type 4 conforming to EN 61496, relay or solid-state output) monitoring	38788/16 to 38788/19
Zero speed detection	38788/20
Dynamic monitoring of hydraulic valves on linear presses	38788/21
Monitoring safety stop at top dead centre on eccentric press	38788/22 to 38788/25
Safety time delays	38788/26
“Muting” function of light curtains	38788/27
Enabling switch monitoring, 2 or 3 contact	38788/28 and 38788/29
Hydraulic press	38788/30 and 38788/31
Eccentric press	38788/32 and 38788/33
Foot switch monitoring	38788/34
Chain shaft breakage monitoring	38788/35
Position selector	38788/36 and 38788/37

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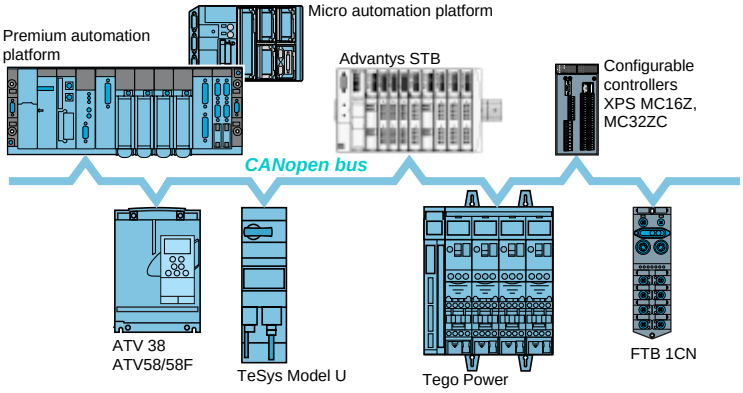
Communication

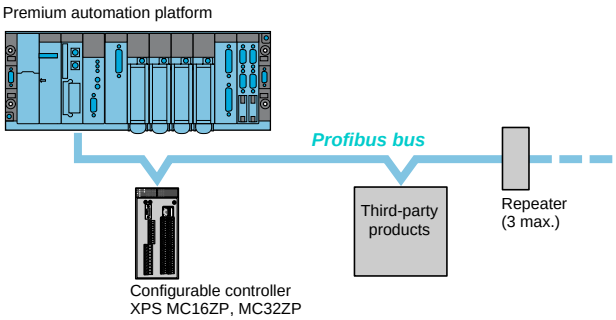
CANopen fieldbus



Configurable safety controllers XPS MC●●ZC incorporate a SUB-D 9-pin male connector for direct connection on CANopen bus.

CANopen bus is a multi-master bus that ensures deterministic and safe access to the real-time data of automation equipment.
The bus uses a shielded dual twisted pair on which a maximum of 127 devices can be connected by chaining.
The data rate varies between 20 Kbps and 1Mbps depending on the length of the bus (2500 m to 20 m).

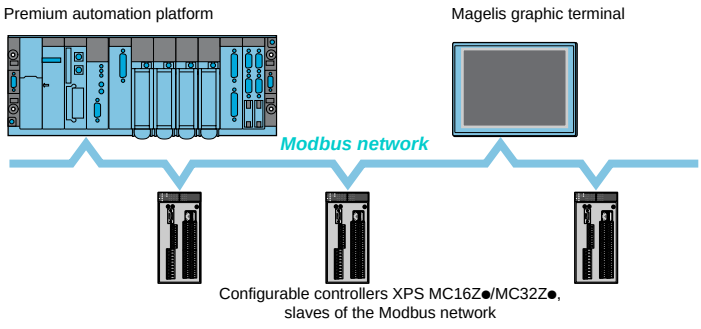
Profibus bus



Configurable safety controllers XPS MC●●ZP incorporate a SUB-D 9-pin female connector for connection on Profibus bus.
Configurable safety controllers XPS MC●●ZP are slaves on the Profibus bus.

Profibus bus is a fieldbus that meets industrial communication requirements. The topology of the Profibus bus is of the linear type with a centralised master/slave type access procedure. The physical link is a single shielded twisted pair.

Modbus network


Premium automation platform
Magelis graphic terminal
Modbus network
Configurable controllers XPS MC16Z●/MC32Z●, slaves of the Modbus network

Configurable safety controllers XPS MC●●Z● MC incorporate a Modbus communication interface (RJ45 socket) for configuration and diagnostics.
This interface enables connection of the controllers to:
- a PC (configuration),
- a PLC (diagnostics), or
- an operator dialogue terminal (diagnostics).

The Modbus network comprises a master station (Premium automation platform) and slave stations (Configurable controllers XPS MC16/32Z●).
Two exchange mechanisms are possible:
- Question/response, the questions from the master are addressed to a given slave. The response is expected by return from the interrogated slave.
- Distribution, the master distributes a message to all the stations of the bus. The latter execute the order without transmitting a reply.

Characteristics: pages 38789/6 and 38789/7
References: pages 38789/8 and 38789/9
Dimensions: page 38789/9
Functions: pages 38788/2 to 38788/37

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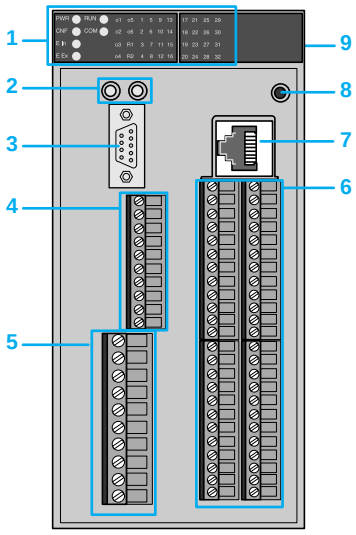
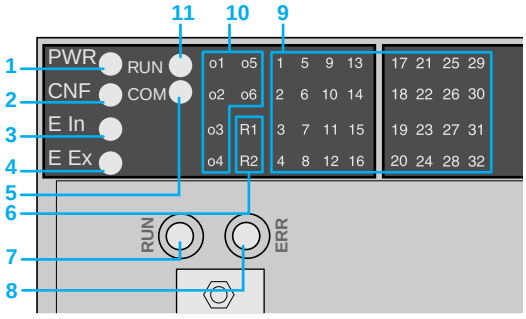


Configurable safety controller XPS MC●●Z●, with screw connectors



Illuminated display

Description

Configurable safety controllers XPS MC●●Z●

Front face of controllers:

1 LED display and system diagnostics.
2 Two LEDs for CANopen or Profibus *(1)* connection status.
3 SUB-D 9-pin male connector for connection on CANopen bus (**XPS MC16ZC/ MC32ZC**)
or SUB-D 9-pin female connector for connection on Profibus bus (**XPS MC16ZP/ MC32ZP**).
4 Solid-state safety output and “muting” indicator light terminals.
5 Power supply (⎓ 24 V) and relay safety output terminals.
6 Control output terminals for power supply to safety inputs and safety input terminals.
7 RJ45 connector for connection on Modbus network.
8 RESET button (resetting of controller).

Rear face of controllers:

9 Fixing plate for mounting on rail.

(1) Depending on controller model.

LED details

	LED	Colour	Status	Meaning
1	PWR	Green	On	Supply voltage present.
2	CNF	Yellow	On	In configuration mode.
			Flashing	Not configured, initial power-up.
3	E In	Red	On	Internal error: all safety outputs deactivated.
4	E Ex	Red	On	External error: all safety outputs associated with the defective circuit are deactivated.
5	COM	Green	On	Controller communicating via the TER (RJ45) connection.
6	R1, R2	Green	On	Relay outputs 13/14, 23/24, 33/34 and 43/44 activated.
			Flashing	Fault on these outputs.
7	RUN	Green	Off	Card and hardware OK for the Profibus bus.
			On	Communicating on Profibus bus. Normal status.
8	ERR	Red	On	Communication impossible, configuration error, damaged cabling or absence. Bus deactivated
			Off	Communicating on CANopen or Profibus bus. Normal status.
			Flashing (x 1)	Control event error on CANopen bus.
			Flashing (x 2)	Synchronisation error on CANopen bus.
			Flashing (x 3)	Invalid configuration on CANopen bus.
9	1…16 1…32	Green	On	Input circuit closed.
			Flashing	Error detected on input relating to LED.
10	o1…o6	Green	On	Solid-state output activated.
			Flashing	Short-circuit, fault on output.
11	RUN	Green	On	Run mode.
			Flashing	Changing from run mode to stop mode.

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References: pages 38789/8 and 38789/9
Dimensions: page 38789/9
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Safety automation solutions
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Characteristics

Configurable safety controller type				XPS MC16Z and MC32Z, XPS MC16ZC and MC32ZC, XPS MC16ZP and MC32ZP
Conformity to standards				EN 60204-1, EN 1760-1, EN 60947-5-1, EN 61496-1, EN 574, EN 954-1, IEC 61508
Product certifications				UL, CSA, TÜV
Products designed for max. use in safety related parts of control systems (conforming to EN 954-1 and IEC 61508)				Category 4 max. (EN 954-1), SIL 3 max. (IEC 61508)
Supply voltage			**V**	⎓ 24 ± 20%
Maximum consumption			**W**	12
Fuse protection			**A**	16 gL max.
Start button monitoring				Configurable
Control circuit voltage				28.8 V/13 mA (between input terminals C1-I1 to C8-I16, resp. I32)
Calculation of wiring resistance RL			Ω	100 max, maximum cable length: 2000 m (Between input terminals)
Synchronisation time between inputs			**s**	Depending on configuration selected
Outputs	**Relay**	Voltage reference		Volt-free
		Safety circuit		2 N/O per function (4 N/O total) (13-14, 23-24, 33-34, 43-44)
		Breaking capacity in AC-15	**VA**	C300: inrush 1800, maintained 180
		Breaking capacity in DC-13		24 V/1.5 A L/R = 50 ms
		Thermal current (Ithe) for each group of 2 outputs	**A**	6 for 1 output and 2 for the other, **or** 4 for both outputs.
		Current limit	**A**	Ith ⩽ 16 (with several relay output circuits simultaneously loaded)
		Output fuse protection	**A**	4 gL or 6 quick blow
		Minimum current	**mA**	10 *(1)*
		Minimum voltage	**V**	17 *(1)*
	Solid-state	Breaking capacity		24 V/2 A
		Safety circuit		6 solid-state (O1, O2, O3, O4, O5, O6)
		Current limit	**A**	Ith ⩽ 6.5 (with several solid-state output circuits simultaneously loaded)
Electrical durability				See page 38610/6
Response time on input opening			**ms**	Response time = 20 or 30, configurable using software XPSMCWIN □ if 20 for controllers XPS MC●●Z●: 30 for a safety mat □ if 30 for controllers XPS MC●●Z●: 45 for a safety mat
Rated insulation voltage (Ui)			**V**	300 (degree of pollution 2 conforming to IEC 60647-5-1, DIN VDE 0110 part 1)
Rated impulse withstand voltage (Uimp.)			**kV**	4 (overvoltage category III, conforming to IEC 60647-5-1, DIN VDE 0110 part 1)
LED display				30 (XPS MC16Z), 46 (XPS MC32Z) 32 (XPS MC16ZC/MC16ZP, 48 (XPS MC32ZC/MC32ZP)
Temperature	Operating		**°C**	- 10…+ 55
	Storage		**°C**	- 25…+ 85
Degree of protection				IP 20 conforming to IEC 60529 (connector and enclosure)

(1) The controller is also capable of switching low power loads (17 V/10 mA minimum) provided that the contact has not been used for switching high power loads (possible contamination or wear of the gold layer on the contact tips).

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Communication

Modbus network

Compatibility			XPS MC16Z, XPS MC32Z, XPS MC16ZC, XPS MC32ZC, XPS MC16ZP, XPS MC32ZP
Serial link ports	Number and type		1 x RJ45
	Status		Slave
Addressing			1 …247
Speed (Baud)		**bps**	1200, 2400, 4800, 9600 or 19200
Parity			Even, odd, none
Fixed parameters			RTU (Remote Terminal Unit) mode 1 start bit / 8 data bits 1 stop bit stop with “even” or “odd” parity 2 stop bits without parity
Functions supported			01: 8-bit output data / 32-bit input data (0 = OFF, 1 = ON) 02: 32-bit input data / 8-bit output data (0 = OFF, 1 = ON) 03: information and errors

CANopen bus

Compatibility			XPS MC16ZC, XPS MC32ZC
Serial link ports	Number and type		1 x SUB-D 9-pin male
Data exchange			By included dual port memory
Parameters (adjustable using software XPSMCWIN)	Speed (Baud)	**Kbps**	50, 125, 250, 800
		Mbps	1
	Address		1…63

Profibus bus

Compatibility			XPS MC16ZP, XPS MC32ZP
Serial link ports	Number and type		1 x SUB-D 9-pin female
Data exchange			By included dual port memory, only data addresses
Parameters	Speed (Baud)	**Mbps**	12
	Address		1…125

Connections

Type				Separate plug-in screw connector XPS MCTS●● *(1)*	Separate plug-in spring clip connector XPS MCTS●● *(1)*
Power supply and relay output terminals					
	1 conductor	Without cable end		Solid or flexible cable: 0.2…2.5 mm², AWG 24-12	
		With cable end	**mm²**	Without bezel, flexible cable: 0.25…2.5	
			mm²	With bezel, flexible cable: 0.25…2.5	
	2 conductors	Without cable end	**mm²**	Solid or flexible cable: 0.2…1.5	–
		With cable end	**mm²**	Without bezel, flexible cable: 0.25…1.5	–
			mm²	Double, with bezel, flexible cable: 0.5…1.5	Double, with bezel, flexible cable: 0.5…1
	Tightening torque of screw terminals		**Nm**	0.5…0.6	–
	Wire stripping length		**mm**	10	
Other terminals					
	1 conductor	Without cable end		Solid or flexible cable: 0.14…1.5 mm², AWG 28-16	
		With cable end	**mm²**	Without bezel, flexible cable: 0.25…1.5	
			mm²	With bezel, flexible cable: 0.25…0.5	
	2 conductors	Without cable end	**mm²**	Solid cable: 0.14…0.5 Flexible cable: 0.14…0.75	–
		With cable end	**mm²**	Without bezel, flexible cable: 0.25…0.34	–
			mm²	Double, with bezel, flexible cable: 0.5	–
Enclosure fixing (conforming to DIN EN 50022)				Metal adaptor for fixing on ⊓ 35 mm metal rail	

(1) To be ordered separately.

Presentation, description: pages 38789/2 to 38789/5
References: pages 38789/8 and 38789/9
Dimensions: page 38789/9
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XPS MC16Z

XPS MC32Z

XPS MC16ZC

XPS MC32ZC

XPS MC16ZP

XPS MC32ZP

References

Configurable safety controllers (connector not included)

Number of inputs	Number of outputs		Communication (Network and bus)	Reference	Weight
	Relay	Solid-state			kg
16	**4 (2 x 2)**	**6**	Modbus	**XPS MC16Z**	0.820
			Modbus, CANopen	**XPS MC16ZC**	0.820
			Modbus, Profibus	**XPS MC16ZP**	0.820
32	**4 (2 x 2)**	**6**	Modbus	**XPS MC32Z**	0.840
			Modbus, CANopen	**XPS MC32ZC**	0.840
			Modbus, Profibus	**XPS MC32ZP**	0.840

Plug-in connectors for configurable safety controllers *(1)*

Description	For use with	Reference	Weight kg
Screw connectors	XPS MC16Z, XPS MC16ZC, XPS MC16ZP	**XPS MCTS16**	0.080
	XPS MC32Z, XPS MC32ZC, XPS MC32ZP	**XPS MCTS32**	0.110
Spring clip connectors	XPS MC16Z, XPS MC16ZC, XPS MC16ZP	**XPS MCTC16**	0.080
	XPS MC32Z, XPS MC32ZC, XPS MC32ZP	**XPS MCTC32**	0.110

Configuration software

Description	Characteristics	Reference	Weight kg
Configuration software XPSMCWIN for controllers XPS MC●●Z●	CD-ROM + user manual Operating system: Windows NT®, 2000 or XP	**SSV1XPSMCWIN** *Available on Safety Suite V1 software pack*	0.520

(1) To be ordered separately to the controllers.

Presentation, description: pages 38789/2 to 38789/5
Characteristics: pages 38789/6 and 38789/7
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Safety automation solutions
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XPS MCCPC

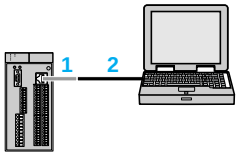
TSX PCX 1031

TSX CAN TDM4

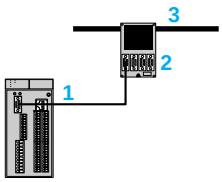
References

Connecting cables *(1)*

Function		Length m	Reference	Weight kg
Diagnostics using Magelis operator dialogue terminal type XBT G (using adaptor XPS MCCPC)		2.5	**XBT Z968**	0.180
Configuration software	1 Adaptor: RJ45 socket/PC connection cables	–	**XPS MCCPC**	0.011
	2 Cable to PC serial port	2.5	**TSX PCX 1031**	0.170
	2 Cable to PC USB port	2.5	**TSX PCX 3030**	–



Function	Medium	Length m	Reference	Weight kg
Modbus network access	Premium automation platform TSX SCY 21601	–	**XPS MCSCY**	–
CANopen bus access	1 CANopen connection cables (fitted with: 1 SUB-D 9-pin female connector at each end)	0.3	**TSX CANCADD03**	–
		1	**TSX CANCADD1**	–
		3	**TSX CANCADD3**	–
		5	**TSX CANCADD5**	–
	2 CANopen tap-off box	–	**TSC CANTDM4**	–
	3 Standard CANopen cables	50	**TSX CANCA50**	–
		100	**TSX CANCA100**	–
		300	**TSX CANCA300**	–
Profibus bus access		100	**TSX PBS CA100**	–
		400	**TSX PBS CA400**	–



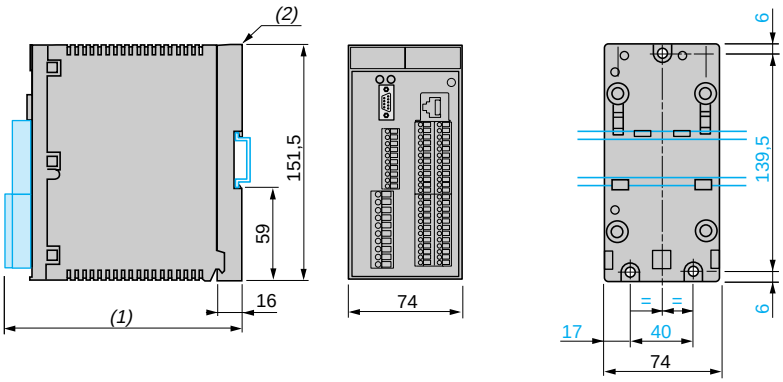
Accessories

Regulated switch mode power supply, single-phase	Output voltage: ⎓ 24 V Nominal current: 10 A Nominal power: 240 W	**ABL 7RP2410**	2.200

(1) To be ordered separately.

Dimensions, mounting

XPS MC●●Z●



(1) 153 mm with screw connector XPS MCTS●●. 151.4 mm with spring clip connector XPS MCTC●●.
(2) Metal adaptor for fixing on metal ⊓ 35 mm rail.